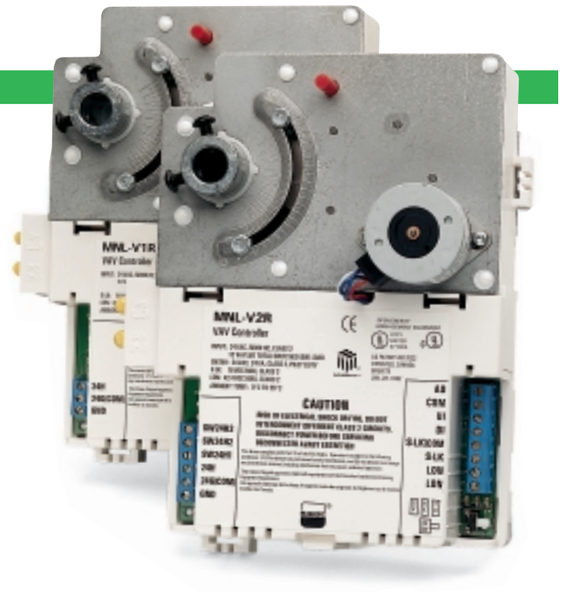
MNL-V1RVx
MNL-V2RVx

I/A Series®

MicroNet LonMark® VAV Series Controllers



LonMark®

The I/A Series MicroNet LonMark VAV Series (Variable Air Volume) Controllers are interoperable, LonMark-compliant controllers. When programmed using WorkPlace Tech Tool or loaded with a pre-engineered application, they provide a wide range of control strategies for pressure independent terminal boxes with, or without, reheat capabilities. Both models provide an integral actuator with manual override, an integral patented pressure transducer, one digital input, one universal input, Sensor Link (S-Link) support, LED indication, and over-the-shaft damper mounting. In addition, the MNL-V2RVx model provides one analog output and three digital outputs. These controllers can function either in a standalone mode or as part of a LonWorks® FTT-10 Free Topology communications network.

Applications

Designed for new or existing systems, the VAV series controllers may be applied to pressure independent terminal boxes with, or without, reheat capabilities. The VAV series controllers offer the following types of Box Configuration and Reheat control strategies:

- Cooling
- Series Fan
- Parallel Fan
- Induction
- Staged Electric Reheat
- Floating/Proportional Hydronic Reheat
- Time Proportioned

Connectivity

The VAV series controllers offer the advantages of standalone or networked control. Using an I/A Series MicroNet Sensor (MN-SX series), the operator can monitor controller performance and edit operational values. The WorkPlace Tech Tool software is used to program the controllers or download applications from the application library.

Features —

- Capability to function in standalone mode or as part of a LonWorks FTT-10 Free Topology communications network.
- Integrated packaging with actuator, pressure transducer, and controller.
- Patented pressure transducer for years of reliable, accurate air flow readings.
- Integral actuator with manual override and travel limit settings for easy set up and support.
- Proportional (P), Proportional Plus Integral (PI), and Proportional Plus Integral and Derivative (PID) control for cooling and heating.
- Both controller models have plenum-rated enclosures.
- Air balancing using the I/A Series MicroNet VAV Flow Balance software.
- Conforms to the LonMark VAV controller profile.

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Model Chart.

Model	Inputs/Outputs				Control Strategies		
	Digital Inputs	Digital Outputs	Universal Inputs	Analog Outputs	Box Configuration	Reheat Type	Other
MNL-V1RVx[a]	1	0	1	0	• Cooling	• None	• None
MNL-V2RVx[a]	1	3	1	1	• Cooling • Series Fan • Induction • Parallel Fan	• Staged Electric Reheat • Floating/Proportional Hydronic Reheat • Time Proportioned	• Occupancy • Satellite[b]

[a] V denotes LonMark VAV (Variable Air Volume) profile. "x" denotes profile version.
[b] Available control strategies depend on controller I/O.

Hardware Specifications

Dimensions 7 3/4" high x 6 1/4" wide x 2 1/2" deep (197 mm x 159 mm x 63 mm).

Enclosure Conforms to NEMA-1 requirements. Meets UL94-5V flammability for plenum application use.

Conduit Knockouts Not applicable. Order optional MicroNet Enclosure, MNA-FLO-1, if wiring to flexible conduit is desired.

Power Supply Input 20.4 to 30 Vac, 50/60 Hz.

Maximum Power Consumption
MNL-V1RVX Maximum 12 VA.
MNL-V2RVX Maximum 84 VA (12 VA plus DO loads @ 24 VA each).

Surge Immunity Compliance
ANSI C62.41 (IEEE-587, Category A & B).

Agency Listings
FCC, Class B.
UL Listed
UL-916 (File # E71385 Category PAZX).
UL Listed to Canadian Safety Standards (CAN/CSA C22.2).

European Community – EMC Directive 89/336/EEC
Emissions EN50081-1
Immunity EN50082-1

Ambient Limits
Operating Temperature 32 to 131 °F (0 to 55 °C).
Shipping and Storage Temperature -40 to 160 °F (-40 to 71 °C).
Humidity 5 to 85% RH, non-condensing.

Wiring Terminals Screw terminals.
Single AWG #14 (2.5 mm^2) wire. Up to two AWG #18 (1.0 mm^2) or smaller wires.

Velocity Pressure Input
Operating Range 0.0 to 2.5 in. of W.C. (0.0 to 0.622 kPa).
Control Range 0.01 to 2.00 in. of W.C. (0.0025 to 0.498 kPa).
Accuracy ± 5% @ 1.00 in. of W.C. (0.249 kPa) with Laminar flow @ 77 °F (25 °C) and suitable flow station.
Sensor Type Self-calibrating flow sensor (differential pressure).
Tubing Connections Barb fittings for 0.170" I.D. FRPE polyethylene tubing or 1/4" O.D./0.125" I.D. tygon tubing (high and low pressure taps).
Tubing Length 5 ft. (1.52 m) maximum each tube.

Input (from I/A Series MicroNet Sensor)
Space Temperature 32 to 122 °F (0 to 50 °C).
Adjustable Setpoints 40 to 95 °F (4.4 to 35 °C).
Operational Mode Heat/Cool/Auto/Off.
Override Pushbutton For stand-alone occupancy control or remote status monitoring of local status condition.

Actuator Output
Torque Rating 53 lb.-in. (6 N-m).
Stroke Fully adjustable from 0° to 90°.
Timing Approximately 3 minutes at 60 Hz (3.6 minutes at 50 Hz) for 90° rotation @ 24 Vac.
Position Indication Provides a visual indication of position.
Manual Override Pushbutton to allow manual positioning of the damper.
Damper Linkage 1/2" (12.75 mm) or 3/8" (9.5 mm) diameter round shaft extending 7/8" (22.23 mm) minimum from terminal box. 3/8" (9.5 mm) diameter shaft requires AM-135 adapter kit.

Digital (Relay) Outputs (MNL-V2RVX)
SW24H1, SW24H2, and SW24H3 Current Ratings
24 VA each at 24 Vac, 50/60 Hz. Form A Single Pole Single Throw (SPST). Normally open. 300K cycles at 24 Vac, 24 VA (0.4 power factor).

Digital Input Dry Contact. Detection of closed switch requires less than 300 Ω. Detection of open switch requires more than 100K Ω.

Universal Input

1K Ω Balco Input -40 to 250°F (-40 to 121°C) range. TS-8000 Series or equivalent.

1K Ω Platinum Input -40 to 240°F (-40 to 116°C) range. TS-5800 Series or equivalent.

10K Ω Thermistor w/ 11K Ω Shunt Resistor -40 to 250°F (-40 to 121°C) range. TS-8000 Series or equivalent.

Voltage 0 to 5 Vdc.

Current 0 to 20 mA requires an external 250 Ω shunt resistor.

Digital Input Detection of closed switch requires less than 300 Ω resistance. Detection of open switch requires more than 1.5K Ω.

Analog Output (MNL-V2RVX)

Current 0 to 20 mA (output load from 80 to 550 Ω).

Software Capabilities

- LonMark-compliant (VAV Controller Profile 8010).
- WorkPlace Tech Tool is capable of reconfiguring and editing application configuration data to fit a wide range of variable air volume control requirements.
- HVAC interoperability achieved through use of LonMark HVAC profiles.
- Air balancing provided by the I/A Series MicroNet VAV Flow Balance software.

Communications

LonWorks Networks A LonWorks communications network uses an FTT-10 Free Topology configuration. Controllers on a LonWorks network can communicate with each other in a peer-to-peer fashion, and connect to the WorkPlace Tech Tool software platforms via the LON Jack on any LonMark controller or on any MN-Sx sensor. The wall sensor must be connected to the LON network. A LonWorks network has a communications speed of 78k baud, using unshielded, twisted-pair cabling.

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S-Link A Sensor Link (S-Link) communications wiring provides power and communication interface to the I/A Series MicroNet sensor (MN-SX series). It uses two-wire, unshielded cable and is not polarity sensitive. From some sensor models, the user can view and adjust application parameters. Maximum wire length allowed between a controller and the I/A Series MicroNet Sensor is 200 ft. (61 m).

I/A Series MicroNet VAV Flow Balance Software

Provides flow balancing for networked and standalone VAV series controllers. Features include:

- Local network control.
- Damper and fan adjustment.
- Setpoint monitoring and adjustment.
- Flow validation and calibration.
- Sequence, calibration, and control setpoint logs.

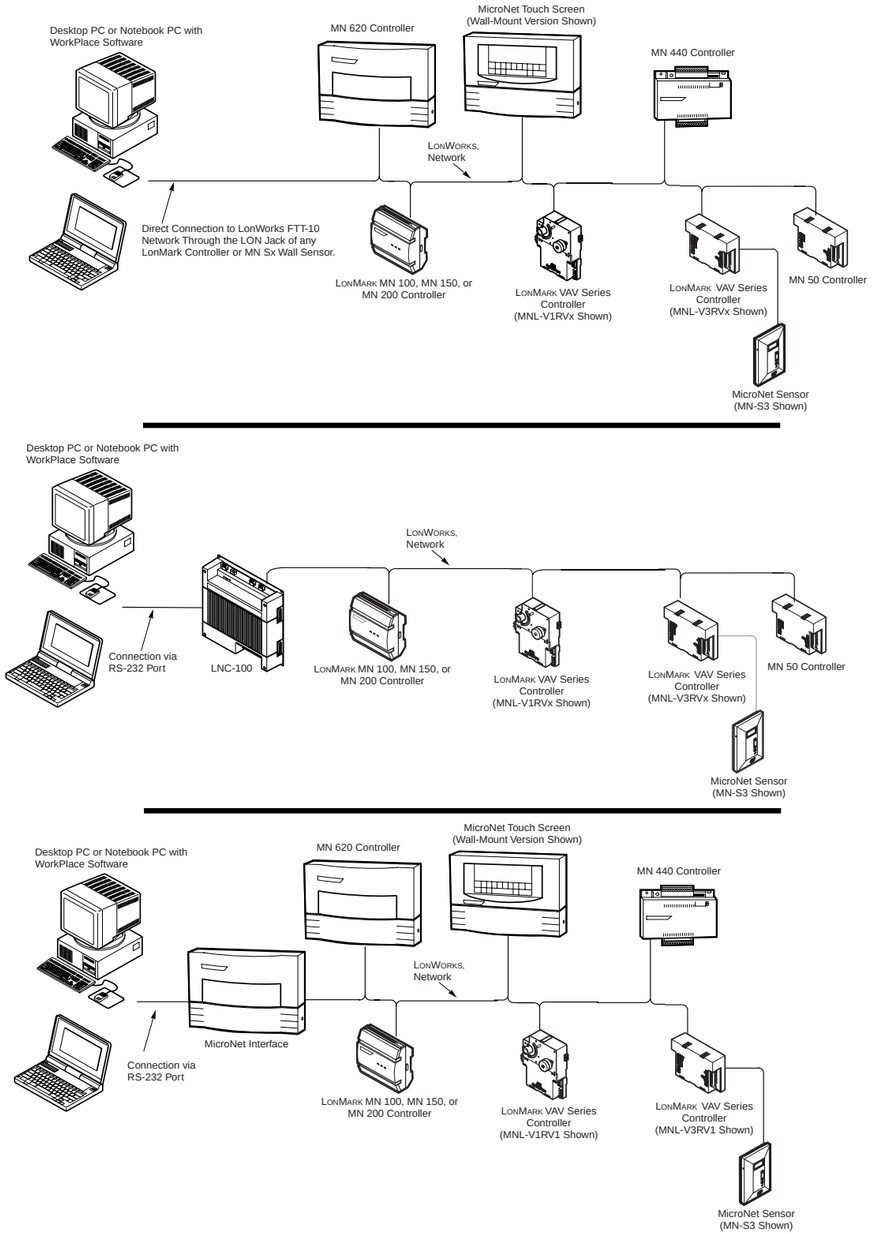
Desktop PC or Notebook PC with WorkPlace Software
MN 620 Controller
MicroNet Touch Screen (Wall-Mount Version Shown)
MN 440 Controller
LonWorks, Network
Direct Connection to LonWorks FTT-10 Network Through the LON Jack of any LonMark Controller or MN Sx Wall Sensor.
LonMark MN 100, MN 150, or MN 200 Controller
LonMark VAV Series Controller (MNL-V1RVx Shown)
LonMark VAV Series Controller (MNL-V3RVx Shown)
MN 50 Controller
MicroNet Sensor (MN-S3 Shown)
Desktop PC or Notebook PC with WorkPlace Software
LonWorks, Network
Connection via RS-232 Port
LNC-100
LonMark MN 100, MN 150, or MN 200 Controller
LonMark VAV Series Controller (MNL-V1RVx Shown)
LonMark VAV Series Controller (MNL-V3RVx Shown)
MN 50 Controller
MicroNet Sensor (MN-S3 Shown)
Desktop PC or Notebook PC with WorkPlace Software
MN 620 Controller
MicroNet Touch Screen (Wall-Mount Version Shown)
MN 440 Controller
LonWorks, Network
Connection via RS-232 Port
MicroNet Interface
LonMark MN 100, MN 150, or MN 200 Controller
LonMark VAV Series Controller (MNL-V1RV1 Shown)
LonMark VAV Series Controller (MNL-V3RV1 Shown)
MicroNet Sensor (MN-S3 Shown)

Figure-1 I/A Series MicroNet LonMark VAV Series Controller Connectivity.

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